

### **REMARKS/ARGUMENTS**

Claims 1-46 and 73-79 are pending in this application. Claims 14, 15, 19, 20, 39-42, 45, 46 and 76 are withdrawn by the Examiner from further consideration in this application pursuant to 37 C.F.R. 1.142(b) as being drawn to a non-elected invention, there allegedly being no allowable linking or generic claim. Thus, claims 1-13, 16-18, 21-38, 43-44, 73-75 and 77-79 have been examined by the Examiner on their merits. Several claims are amended and two new claims (nos. 80-81) are added herein. The claim amendments and new claims, as discussed below, are all supported by the application as originally filed. Thus they raise no issue of new matter.

Claims 1-13, 16-18, 21-38, 43-44, 73-75 and 77-79 have all been rejected by the Examiner. Reconsideration is respectfully requested based on the claim amendments and remarks presented herein.

#### **Priority Application**

On p. 2 of the Office Action the Examiner notes that the present application is a national stage entry of International Application No. PCT/EP04/04703 filed May 4, 2004 which, in turn, claims the priority of German application No.103 19 917.9 filed on May 5, 2003. The Examiner acknowledges that a certified copy of the German priority application has been filed in this case. She notes, however, that the German National application is written in the German language and no English translation has been supplied.

In response, submitted herewith is a verified translation of the German priority application.

#### **Information Disclosure Statements**

At pp. 2-3, the Office Action states that in the IDS submitted November 4, 2005 the lined-through references were not considered because a full citation of those references was not provided. In response, provided with this Amendment is a form (re-)listing each of the lined-through references cited in the previously filed IDS using the appropriate format. Additional copies of the references are not being submitted with the form since they were already provided

when the IDS was earlier filed. However, if the Examiner desires to receive extra copies of any of these references, they will be provided upon her request.

The Office Action additionally states (p. 3) that of the Information Disclosure Statements submitted January 7, 2008 and May 14, 2008, the Russian Office Actions were not considered because they are not in English and no concise explanation of the documents was considered. In response, applicants note that the two Russian Office Actions are re-listed on the form provided with this Amendment and English-language translations of these Office Actions are being provided herewith.

The Examiner is, thus, respectfully requested to make all of the references listed on the attached forms submitted herewith of record in the present application by initialing and dating the forms and returning a copy to applicants' representative with the Examiner's next communication concerning this application.

#### **Claim Rejections Under 35 U.S.C. §112**

On p. 3 of the Action, claims 1 and 23 (and their dependent claims) are rejected under 35 U.S.C. §112, second paragraph, due to the inclusion therein of the term "nanodispersed". The Examiner states that it is unclear whether "nanodispersed" relates to a specific particle size.

In response to the rejection, applicants have amended claims 1 and 23 to further define the "nanodispersed gold particles" recited therein. The subject particles are now described in independent claims 1 and 23, as having a diameter of less than 20 nm. The amendment to the claims is supported by the disclosure p. 9, lines 1-15 of applicants' specification. Thus there is no issue of new matter raised by the amendments.

Even notwithstanding the amendments to the claims, however, applicants respectfully submit that one having an ordinary level of skill in this art at the time the present application was filed would have found the recitation of "nanodispersed gold particles" in claims 1 and 23 to be readily understandable. That is, as is clear from the context of this application, the term "nanodispersed" relates to the subject of dispersed nanoparticles. Such particles and their features, including their sizes, were very familiar to those who work in this field, both now

and at the time the present application was originally filed. Furthermore, the subject nanoparticles (and their dimensions) are discussed and described throughout the specification of the present application, i.e., including at p. 9, lines 1-15 as noted above.

The Examiner is, thus, respectfully requested to reconsider and withdraw the rejection of applicants' claims 1 and 23, and their dependent claims, under 35 U.S.C. §112.

The Office Action additionally states that claims 7, 31 and 32 are rejected under 35 U.S.C. §112, second paragraph, because they include the limitation, "preferably".

In response, applicants respectfully submit that claim 32 is believed to be included in the rejection due to error, since it does not include the limitation "preferably". The claim reads, "The method as claimed in claim 23, where the oxidation is carried out under a pressure of from 1 bar to 25 bar.". The Examiner is, thus, respectfully requested to withdraw the rejection of claim 32 under 35 U.S.C. §112 as there appears to be no basis for such a rejection.

Regarding rejected claims 7 and 32, however, applicants have amended the subject claims to remove the "preferred" values from the claims. This amendment is believed to overcome the rejection of those claims under §112, second paragraph. Furthermore, the 'preferred' ranges are now the subject of two new dependent claims added to the application, i.e., nos. 80 and 81. No new matter is added by addition of these two new claims and their entry into the file of this application is respectfully requested.

The Examiner is respectfully requested to reconsider and withdraw the rejection of claims 7 and 32 under §112, second paragraph, based on the above-described amendments made to those claims.

### **Claim Rejections Under 35 U.S.C. §103**

Claims 1-13, 16-18, 21-38, 43-44, 73-75 and 77-79 are rejected under 35 U.S.C. §103 over Biella et al. (Journal of Catalysis, 206, 242-247 (2002)) in view of Fuertes et al. U.S. Patent No.4,985,553 and Biella et al. (Catalysis Today 72 (2002) 43-49). The rejection is respectfully traversed.

In response to the above-described rejection, claim 23 has been amended to further define the claimed support element as a "metal oxide support" (emphasis supplied). The

claim amendment is supported by the application as originally filed due, *inter alia*, to the fact that, as would be well known in this art, the ‘oligosaccharides’ recited in claim 23 are a species of ‘carbohydrates’ as recited in original claim 1. Claim 1 is, thus, generic to claim 23. At least claim 1 and the teachings supporting claim 1 thus also support claim 23 as amended. Following the amendment to claim 23, therefore, both independent claims (nos. 1 and 23) recite the use of a metal oxide support to for, i.e., the selective oxidation of (respectively) carbohydrates (claim 1) and, more specifically, oligosaccharides (claim 23).

Now with specific regard to the present rejection, applicants submit that Biella et al. (Journal of Catalysis) disclose that gold on carbon catalysts are valid alternatives to multi-metallic catalysts that are based on palladium and/or platinum, for several reasons - Gold on carbon catalysts operate without the external control of pH, thus ensuring total conversion at all pH values. Further, gold on carbon demonstrates good resistance to oxygen poisoning and it is probably also less sensitive to chemical poisoning. However, the authors of the reference then also indicate that metal leaching was detected with gold on carbon catalysts, which leads to a gradual decrease in the activity of these catalysts (see, for example, p. 247 under the heading, “Conclusion”, in the second paragraph; p. 245, left column, last three lines; and p. 246, left column; under the heading, “3.2. Oxidation at Uncontrolled pH”, the discussion in the second and third paragraph in connection with Figure 5). Biella et al. (Journal of Catalysis) consider periodic recycling of the gold on carbon catalyst to preserve activity. The Biella et al. Journal of Catalysis reference thus provides a method for selective oxidation of glucose which requires that the catalyst has to be periodically recycled in order to preserve its catalytic activity.

The presently claimed method overcomes the drawbacks of Biella et al., however, due to the fact that the catalyst recited for use in the subject method has a long durability, i.e., as contrasted against the catalyst taught for use in the Journal of Catalysis. The longer-life advantage offered with the use of the catalyst recited for use in the presently claimed method is evidenced, for instance, in Example 3 of the present application. From Table 6, moreover, it is further evident that glucose turnover is not reduced until after the catalyst is used 17 times. This value is contrasted with that given in Fig. 5 of Biella et al. (Journal of Catalysis) where, after being used only 2-4 times the reference discloses that a drastic reduction in catalytic

activity occurs. The presently claimed method, thus, by the use of the catalyst recited for use in, e.g., claims 1 and 23, offers a significant improvement over the results achieved by the process as disclosed in the reference.

Neither could the improvement offered by the presently claimed method have been foreseen based on the disclosure contained in the cited art. That is, there is nothing in the prior art which, in applicants' view, would suggest to one having ordinary skill in this field to provide gold on metal catalysts, and then to use them in the selective oxidation of carbohydrates (including oligosaccharides as per claim 23). Neither the Biella et al. (Journal of Catalysis) reference, nor the '553 U.S. Fuertes et al. patent, nor Biella et al. (Catalysis Today) contains any teaching or suggestion of the presently claimed method of selective oxidation of carbohydrates. Biella et al. (Journal of Catalysis) is completely silent on the subject of metal oxide supported catalysts. Furthermore, the '553 patent contains no disclosure(s) relating to supported gold catalysts. In fact, one of ordinary skill in this art would not even consider the disclosure contained in the Fuertes et al. '553 patent, since the catalysts described therein were known to lack durability and to exhibit other disadvantages (see Biella et al. (Journal of Catalysis), p. 242, left column and Biella et al. (Catalysis Today) p. 48, Tables 9 and 10, wherein an inferior performance of platinum and palladium catalysts, when compared to that achieved with gold catalysts, are documented.

Further to the above, the Biella et al. (Catalysis Today) reference additionally discloses gold on a metal oxide support. However, these are reported to be of an inferior quality and performance in the oxidation of amino alcohols or aldehydes. As evidenced, in particular, by the data provided in Table 3 of the Catalysis Today reference, gold on a metal oxide support always demonstrates less selectivity than gold on carbon catalysts. Furthermore, as evidenced by the data provided in Table 9 of the reference, the activity/turnover of gold on metal oxide in the oxidation of aldehydes is less than half when compared to gold on carbon catalysts. On p. 48, left column, the Catalysis Today reference states that catalysts of gold deposited on three different supports, i.e., C, Al<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub>, "... show different activity making carbon the best support". This clearly supports the use of gold on carbon catalysts, instead of gold on a metal oxide support as presently claimed, for use in the oxidation of aldehydes, and glucose in

particular, due to high selectivity and high catalytic activity offered thereby. In contrast, the reference(s) portray metal oxide supported gold as being less attractive and thus the presently claimed catalysts would not have been suggested by those familiar with the prior art since, in fact, the art teaches away from the selection of the presently claimed catalysts.

Based on the reasons presented above, applicants respectfully submit that independent claims 1 and 23 are entirely distinguishable over the references cited, in combination, to reject applicants' pending claims. Furthermore, the claims depending from nos. 1 and 23 are also believed to be distinguishable for the same reasons as the independent claims as the dependent claims contain all of the elements recited in the independent claim from which each, respectively, depends.

#### Summary

Based on claim amendments and arguments presented herein, the Examiner is respectfully requested to reconsider and withdraw all of the rejections of applicants' claims as set forth in the present Office Action and to issue a Notice of Allowance for all of the claims presently under examination.

Respectfully submitted,

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